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NEW BEDFORD HARBOR
SAMPLE ANALYSIS

Final Report

PRIVILEGED WORK PRODUCT PREPARED
IN ANTICIPATION OF LITIGATION

ENFORCEMENT
CONFIDENTIAL

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TABLES

SECTION 1

INTRODUCTION

This report presents a summary of the results of analysis of four sediment samples submitted to GCA/Technology Division on November 8, 1984 by EPA Region I. The samples were analyzed for EP toxicity metals, pesticides, and herbicides.

Subsequent sections of this report include a discussion of the sample handling and analytical procedures, a description and results of the quality control analysis conducted for this program and Data Report Sheets presenting the results of all sample analysis.

SECTION 2

LABORATORY PROCEDURES

SAMPLE RECEIVING AND CHAIN-OF-CUSTODY

A total of four samples were received by GCA/Technology Division on November 8, 1984. Routine inspection upon receipt revealed all samples to be in good condition and appropriately chilled.

Upon receipt, the submitted samples were entered in the Master Log Book where each sample was assigned a Laboratory Control Number. This unique numerical identification was affixed to the respective sample containers and subsequently used throughout the laboratory procedures for positive traceability. A cross reference list of the submitted samples and assigned Control Numbers is provided in Table 1.

TABLE 1. CROSS REFERENCE LIST OF SUBMITTED SAMPLES

Analysis requested	EPA sample identification	GCA Control No.
EP Toxicity	11479	41633
	11482	41634
	11485	41635
	11487	41636

Chain-of-custody procedures were maintained in the laboratory through the use of Custody Notebooks. At the time of receipt, a page for each sample was entered sequentially by Control Number in the Custody Notebook, and the samples were transferred to the locked Sample Bank for refrigerated storage until the time of analysis. Subsequent handling of the samples was documented by signed entries in the Custody Notebook. In addition, the transfer of samples or sample extracts between analysts within the laboratory was documented on Sample Custody Transfer forms which are entered in the permanent project file and serve as a supplement to the Custody Notebook record of sample handling.

SECTION 3

ANALYTICAL PROCEDURES

EXTRACTION PROCEDURE TOXICITY

The submitted soil samples, quality control samples and a method blank were prepared by the Extraction Procedure (EP) Toxicity method described in Method 1310 (Reference 1).

TRACE METALS

The generated leachate, quality control samples and method blank were analyzed for arsenic, barium, cadmium, lead, selenium and silver by Method 200.7 (Reference 2) quantitation was performed using a Jarrell-Ash 855 ICAP. Analysis of the leachate for hexavalent chromium was performed using the coprecipitation technique described in Method 7195 (Reference 1); quantitation was accomplished using a Jarrell-Ash 855 ICAP. Mercury analysis was performed using the cold vapor technique as described in Method 245.1 (Reference 2); quantitation was accomplished using a Perkin-Elmer Model 460 Atomic Absorption Spectrophotometer.

PESTICIDES

A 500 ml aliquot of each generated leachate was prepared for analysis using the protocols specified in Method 608 (Reference 3). After extraction, all extracts were dried with anhydrous sodium sulfate and reduced to 10 ml via rotary evaporation. Analysis was performed using a Hewlett-Packard 5840 gas chromatograph (GC) with a Ni^{63} electron capture detector (ECD).

HERBICIDES

Leachate samples were prepared for analysis of the herbicides 2,4-D and Silvex using the protocol described in Method 509B (Reference 4). Hydrolyzed extracts were methylated using the diazomethane esterification procedure as described in Reference 5. Analyses were performed via GC/ECD using a Hewlett-Packard 5880.

SECTION 4

QUALITY CONTROL

TRACE METALS

Quality control procedures for the determination of trace metals in the project samples included the analysis of a laboratory control sample (LCS) prepared from an EPA EMSL concentrate and replicate sample analysis. These results are presented in Tables 2 and 3.

PESTICIDES/HERBICIDES

Quality control procedures for the determination of pesticides and herbicides in the submitted samples included the analysis of laboratory control samples (LCS) prepared from EPA EMSL concentrates. These results are presented in Table 4.

TABLE 2. QUALITY CONTROL DATA: ANALYSIS OF A LABORATORY CONTROL SAMPLE FOR TRACE METALS

Element	Concentration (mg/l) Reported	Expected	Percent recovery
Arsenic	0.99	1.00	99
Barium	125	119.6	105
Cadmium	1.30	1.30	100
Chromium (VI)	1.04	1.00	104
Lead	8.30	8.00	104
Mercury	7.2	8.7	83
Selenium	0.48	0.50	96
Silver	4.15	6.00	69

TABLE 3. QUALITY CONTROL DATA: ANALYSIS OF A REPLICATE ALIQUOT OF SAMPLE NO. 11487 (GCA NO. 41636) FOR TRACE METALS

Element	Concentration (mg/l) Aliquot A	Aliquot B
Arsenic	<0.03	<0.03
Barium	0.079	0.065
Cadmium	0.004	0.004
Chromium (VI)	<0.003	0.004
Lead	<0.02	<0.02
Mercury	<0.0005	<0.0005
Selenium	<0.04	<0.04
Silver	<0.005	<0.005

TABLE 4. QUALITY CONTROL DATA: ANALYSIS OF LABORATORY CONTROL SAMPLE FOR PESTICIDES/HERBICIDES

Parameter	Concentration (mg/l) Reported	Expected	Percent recovery
Toxaphene	6.8	7.5	91
2,4-D	5.4	6.06	89
Silvex	1.2	1.29	93

SECTION 5

DATA REPORT SHEETS

Project 0-345-174 GCA Control No. 41633

DATA REPORT SHEET

Metals

Sample I.D. 11479 Analysis Date 11/21/84

Sample Matrix Leachate

Element	Instrument	Concentration (mg/1)	Remarks
Arsenic	Jarrell-Ash 855 ICPS	< 0.03	
Barium	Jarrell-Ash 855 ICPS	0.283	
Cadmium	Jarrell-Ash 855 ICPS	0.024	
Chromium(VI)	Jarrell-Ash 855 ICPS	< 0.003	
Lead	Jarrell-Ash 855 ICPS	0.14	
Mercury	Perkin-Elmer 460 AAS	< 0.0005	Cold Vapor Method
Selenium	Jarrell-Ash 855 ICPS	< 0.04	
Silver	Jarrell-Ash 855 ICPS	0.006	

Project 0-345-174 GCA Control No. 41634

DATA REPORT SHEET

Metals

Sample I.D. 11482 Analysis Date 11/21/84

Sample Matrix Leachate

Element	Instrument	Concentration (mg/l)	Remarks
Arsenic	Jarrell-Ash 855 ICPS	< 0.03	
Barium	Jarrell-Ash 855 ICPS	0.226	
Cadmium	Jarrell-Ash 855 ICPS	0.022	
Chromium(VI)	Jarrell-Ash 855 ICPS	0.095	
Lead	Jarrell-Ash 855 ICPS	0.04	
Mercury	Perkin-Elmer 460 AAS	< 0.0005	Cold Vapor Method
Selenium	Jarrell-Ash 855 ICPS	< 0.04	
Silver	Jarrell-Ash 855 ICPS	< 0.005	

Project 0-345-174 GCA Control No. 41635

DATA REPORT SHEET

Metals

Sample I.D. 11485 Analysis Date 11/21/84

Sample Matrix Leachate

Element	Instrument	Concentration (mg/l)	Remarks
Arsenic	Jarrell-Ash 855 ICPS	< 0.03	
Barium	Jarrell-Ash 855 ICPS	0.059	
Cadmium	Jarrell-Ash 855 ICPS	0.004	
Chromium(VI)	Jarrell-Ash 855 ICPS	0.012	
Lead	Jarrell-Ash 855 ICPS	< 0.02	
Mercury	Perkin-Elmer 460 AAS	< 0.0005	Cold Vapor Method
Selenium	Jarrell-Ash 855 ICPS	< 0.04	
Silver	Jarrell-Ash 855 ICPS	< 0.005	

Project 0-345-174 GCA Control No. 41636

DATA REPORT SHEET

Metals

Sample I.D. 11487 Analysis Date 11/21/84

Sample Matrix Leachate

Element	Instrument	Concentration (mg/1)	Remarks
Arsenic	Jarrell-Ash 855 ICPS	< 0.03	
Barium	Jarrell-Ash 855 ICPS	0.072	
Cadmium	Jarrell-Ash 855 ICPS	0.004	
Chromium(VI)	Jarrell-Ash 855 ICPS	0.004	
Lead	Jarrell-Ash 855 ICPS	< 0.02	
Mercury	Perkin-Elmer 460 AAS	< 0.0005	Cold Vapor Method
Selenium	Jarrell-Ash 855 ICPS	< 0.04	
Silver	Jarrell-Ash 855 ICPS	< 0.005	

Project 0-345-174 GCA Control No. Leachate Blank

DATA REPORT SHEET

Pesticides/Herbicides

Sample I.D. Leachate Blank Analysis Date 11/19/84

Sample Matrix Leachate Instrument HP 5840A GC with Ni^{63} ECD

Parameter	Concentration* (mg/l)	Remarks
Endrin	< 0.02	
Lindane	< 0.4	
Methoxychlor	< 10.0	
Toxaphene	< 0.5	
2,4-D	< 10.0	
Silvex	< 1.0	

*Reported values have been corrected for the appropriate laboratory method blank.

Project 0-345-174 GCA Control No. 41633

DATA REPORT SHEET

Pesticides/Herbicides

Sample I.D. 11479 Analysis Date 11/20/84

Sample Matrix Leachate Instrument HP 5840A GC with Ni^{63} ECD

Parameter	Concentration* (mg/l)	Remarks
Endrin	< 0.02	
Lindane	< 0.4	
Methoxychlor	< 10.0	
Toxaphene	< 0.5	
2,4-D	< 10.0	
Silvex	< 1.0	

*Reported values have been corrected for the appropriate laboratory method blank.

Project 0-345-174 GCA Control No. 41634

DATA REPORT SHEET

Pesticides/Herbicides

Sample I.D. 11482 Analysis Date 11/20/84

Sample Matrix Leachate Instrument HP 5840A GC with Ni^{63} ECD

Parameter	Concentration* (mg/1)	Remarks
Endrin	< 0.02	
Lindane	< 0.4	
Methoxychlor	< 10.0	
Toxaphene	< 0.5	
2,4-D	< 10.0	
Silvex	< 1.0	

*Reported values have been corrected for the appropriate laboratory method blank.

Project 0-345-174 GCA Control No. 41635

DATA REPORT SHEET

Pesticides/Herbicides

Sample I.D. 11485 Analysis Date 11/20/84

Sample Matrix Leachate Instrument HP 5840A GC with Ni^{63} ECD

Parameter	Concentration* (mg/l)	Remarks
Endrin	< 0.02	
Lindane	< 0.4	
Methoxychlor	< 10.0	
Toxaphene	< 0.5	
2,4-D	< 10.0	
Silvex	< 1.0	

*Reported values have been corrected for the appropriate laboratory method blank.

Project 0-345-174 GCA Control No. 41636

DATA REPORT SHEET

Pesticides/Herbicides

Sample I.D. 11487 Analysis Date 11/20/84

Sample Matrix Leachate Instrument HP 5840A GC with Ni^{63} ECD

Parameter	Concentration* (mg/l)	Remarks
Endrin	< 0.02	
Lindane	< 0.4	
Methoxychlor	< 10.0	
Toxaphene	< 0.5	
2,4-D	< 10.0	
Silvex	< 1.0	

*Reported values have been corrected for the appropriate laboratory method blank.

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1. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, D.C., July 1982.

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5. Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples. U.S. Environmental Protection Agency, Research Triangle Park, EPA-600/8-80-038, June 1980.